



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Wakefield Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Wakefield Water Department
<i>PWS Address</i>	108 Broadway
<i>City/Town</i>	Wakefield, Massachusetts
<i>PWS ID Number</i>	3305000
<i>Local Contact</i>	Steven Fitzpatrick - Water/Sewer Supervisor
<i>Phone Number</i>	781-246-6318

Introduction

We are all concerned about the quality of the water we drink. Drinking water may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

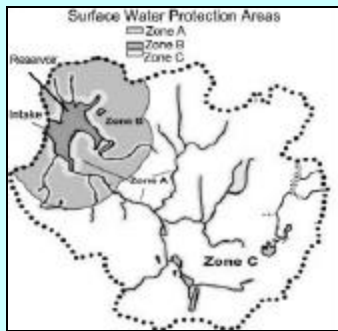
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Glossary Protection Zones

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

Section 1: Description of the Water System

<i>Source Name</i>	<i>Source ID</i>	<i>Susceptibility</i>
Crystal Lake	3305000-01S	High

The Wakefield Water Department purchases approximately 85% of its water supply from the Massachusetts Water Resources Authority (MWRA). About 15% of Wakefield's water is drawn from Crystal Lake Reservoir during times of peak demand. The reservoir water is replenished by its 563.5 acre watershed located in the towns of Wakefield and Stoneham (refer to Map in Attachment A). The reservoir, like all surface water sources, is considered to be highly vulnerable due to the absence of physical barriers that could impede contaminant progress to the source.

Attached please find a copy of the SWAP report prepared for the MWRA sources that supply approximately 85% of the drinking water to the Town of Wakefield. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

The water from Crystal Lake is filtered and disinfected using sodium hypochlorite at the 108 Broadway St. treatment facility before being pumped into the water distribution system. Please contact the Wakefield Water Department for a copy of the most recent annual Consumer Confidence Report for complete water quality and treatment information.

Section 2: Land Uses in the Protection Areas

The watershed for Crystal Lake is a mixture of residential, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Zone A Land Uses
2. Residential Land Uses
3. Wastewater Pump Station Overflows
4. Aquatic Wildlife
5. Transportation Corridors
6. Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone A Land Uses - The Zone A is the land area within 400 feet of a reservoir and 200 feet of its tributaries. The land uses and activities within the Zone A include: urban storm runoff from roads, a railroad right of way, wastewater pump station overflows, a nursery, parking, and wildlife. Public

water systems are responsible for enforcing the prohibition of certain new or expanded land uses within the Zone A, as detailed in 310 CMR 22.20(b).

Zone A Recommendations:

- ✓ Actively monitor new or expanded land uses within the Zone A according to your watershed protocol submitted to DEP.
- ✓ Control stormwater within the Zone A.
- ✓ Control aquatic wildlife within the Zone A.
- ✓ Work with local emergency response teams to practice containment of spills within the Zone A.
- ✓ Conduct regular inspections of the Zone A for illegal dumping and spills.
- ✓ Install water supply protection area signs around the Zone A.
- ✓ Conduct regular inspections of railroad right of way.

2. Residential Land Uses – Approximately 54% of the watershed consists of residential areas. The whole area is served by public sanitary sewers. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.

- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Wastewater Pump Station Overflows – A wastewater pump station in Stoneham is within the Crystal Lake watershed Zone A. In the past, occasional line blockages caused overflows of wastewater to drain to Crystal Lake. These wastewater overflows are a potential source of microbial and non-microbial contamination. Additionally,

there is a smaller wastewater pump station in Wakefield. There are no records of similar problems at this station.

Wastewater Recommendations:

- ✓ Work with the Town of Stoneham DPW to prevent or contain future overflows. Preventing future overflows may involve an engineering solution or other wastewater facility BMPs.
- ✓ Create a joint emergency response plan to contain any future overflows from this station and the one in Wakefield.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

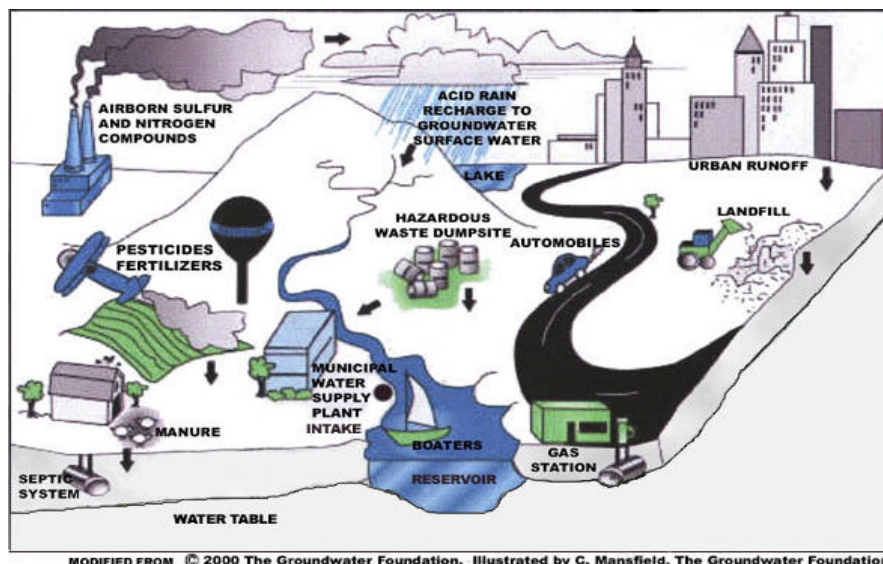


Figure 1: Sample watershed with examples of potential sources of contamination

4. Aquatic Wildlife—Birds, particularly gulls, are attracted to large open bodies of water. Birds may increase coliform levels through the release of fecal matter into the water and may carry other bacteria and viruses. Beaver and muskrat may introduce the pathogens *Giardia* and *Cryptosporidium* into water through fecal matter. Because of their constant contact with the water, these aquatic mammals represent a potential threat to drinking water reservoirs. Appendix A contains a DEP fact sheet titled *What You Need To Know About Microbial Contamination*.

Aquatic Wildlife Recommendations:

- ✓ Monitor wildlife populations in and around reservoirs.
- ✓ Where necessary, discourage and control aquatic wildlife. See <http://mass.gov/dep/brp/dws/protect.htm> for guidance and permits.

5. Transportation Corridors - A railroad corridor runs along the eastern edge of the Zone A. Local roads are common throughout the protection areas. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include substances from automotive leaks, maintenance, washing, or accidents.

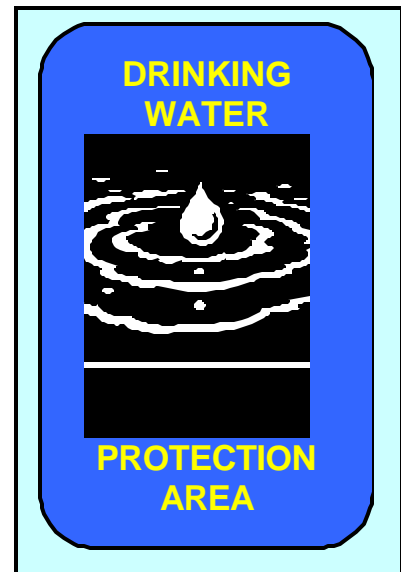
Railroad tracks run directly through the Zone A. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Regularly inspect watershed for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

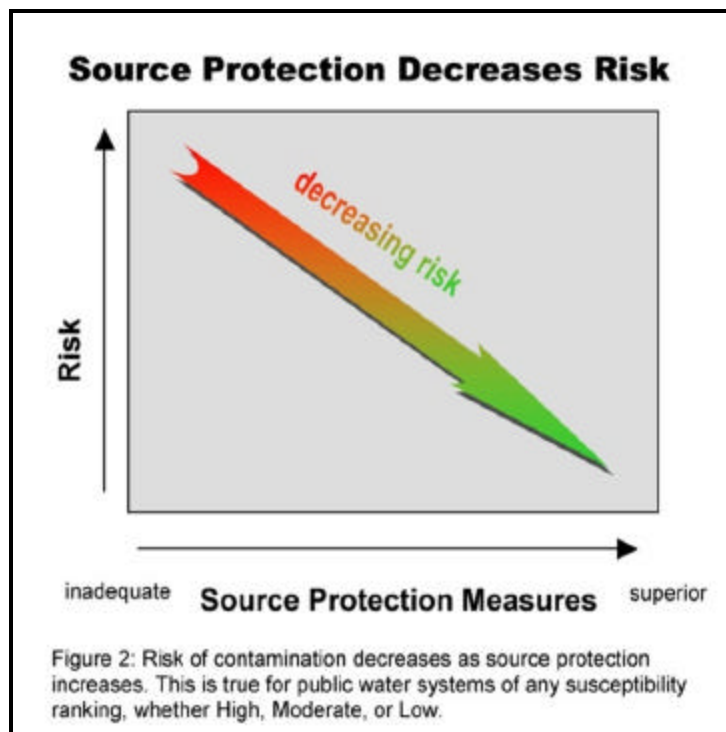
6. Protection Planning – Protection planning protects drinking water by managing the land area that supplies water to a reservoir. Currently, the Town does not have water supply protection controls that meet DEP's Surface Water Protection

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What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.



Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Nurseries	1	M	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling or over-application.
Commercial			
Auto Repair/ Auto Body Shops	2	M	Automotive fluids and solvents: spills, leaks, or improper handling
Gas Stations	2	M	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Residential			
Fuel Oil Storage (at residences)	Several	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Several	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Several	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Aquatic Wildlife	Few	H	Microbial contaminants
Railroad right-of-way	1	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Schools	2	M	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Transportation Corridors	Many	H	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	5	H	Spills, leaks, or improper handling of stored materials
Wastewater Treatment (Pump Stations)	2	H	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

regulations 310 CMR 22.20 (b) and (c). A Surface Water Supply Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply reservoirs.

Protection Planning Recommendations:

- ✓ Implement a Surface Water Supply Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Surface Water Supply Protection Plan".
- ✓ If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.20 (b) and (c). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Because there is no protection for the 34% of the watershed in Stoneham, develop a cooperative protection agreement with the Town of Stoneham.

Other land uses and activities within the Protection areas that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system watershed contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. Wakefield is commended for having received a DEP grant to develop a Surface Water Supply

Protection Plan that includes protection recommendations such as a watershed protection bylaw. Once the plan has been approved by the DEP, Wakefield should implement the identified protection strategies, access restrictions, and watershed protection bylaw/overlay district.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone A regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with the Town of Stoneham DPW to prevent or contain future wastewater pump station overflows.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your watershed and to cooperate on responding to spills or accidents.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Source Protection Grant Program provides funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response (RFR) for the grant program.

Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

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Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Zone A owned or controlled by Public Water Supplier (PWS)	NO	Adopt land use restrictions for watershed lands not owned by the PWS, especially in the Zone A.
Regularly inspect Zone A and other watershed protection lands	YES	Inspection in Stoneham should be part of a cooperative agreement.
Zone A Storm drain locations identified (contributing to reservoir)	YES	Management options include signs, control structures, and vegetative barriers
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Watershed Protection Bylaw	NO	Adopt local regulations to protect the watershed. Contact DEP's Kathy Romero at (617) 292-5727 for sample bylaws.
Hazardous Materials Controls	NO	Develop commercial registration and inspection program for tracking chemical storage and use. For guidance see Hazardous Materials Management: A Community's Guide at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Controls on public access relating to the reservoir and watershed	NO	Work with Stoneham to develop restrictions for watershed lands within Stoneham.
Protection of watershed extending into neighboring communities	NO	Improving cooperation with Stoneham is a priority.
Planning		
DEP approved protection plan	NO	Develop watershed protection plan. Follow "Developing a Local Surface Water Supply Protection Plan" to develop a watershed protection plan for DEP approval.
Formal "Emergency Response Plan" to deal with spills or other emergencies	YES	Augment plan by developing a joint emergency response plan with MBTA, DPW, and local emergency officials. Coordinate drills.
Water supply protection committee	NO	Establish committee; include representatives from citizens' groups, Stoneham, and the business community.
Board of Health inspections of commercial and industrial activities	YES	Support Fire Department efforts to expand UST removal and replacement program.
Provide protection education	YES	Aim additional efforts at storm drains and commercial uses within the watershed. Coordinate with Stoneham.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the watershed. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Protection Recommendations
- B. Additional Documents on Source Protection

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and town boards.

APPENDIX A: DEP PERMITTED FACILITIES WITHIN WAKEFIELD'S WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
340171	FITZ MACHINE	4 RAILROAD AVENUE	WAKEFIELD	HANDLR	VERY SMALL QUANTITY GENERATOR WASTE OIL/PCBS
134399	RAWSON AUTO BODY INC	71 BROADWAY	WAKEFIELD	HANDLER	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
320167	RILOS AUTO SERVICE	343 MAIN ST	WAKEFIELD	HANDLER	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
320167	RILOS AUTO SERVICE	343 MAIN ST	WAKEFIELD	HANDEL R	SMALL QUANTITY GENERATOR WASTE OIL/PCBS
357381	RILOS AUTO SERVICE & VIP STATION	343 ALBION ST	WAKEFIELD	FUEL DISPENSER	FUEL DISPENSER STAGEII
30648	SAWIN MOTORS INC	75 BROADWAY	WAKEFIELD	HANDLER	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
30964	SERVICE PUMPING & DRAIN CO INC	42 REAL BROADWAY	WAKEFIELD	HANDLER	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
33511	TECCES AUTO BODY	1 RAILROAD AVE	WAKEFIELD	HANDLER	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
33511	TECCES AUTO BODY	1 RAILROAD AVE	WAKEFIELD	HANDLER	RECYCLER - BURNER/BLENDER
280749	WAKEFIELD USED CAR	40 A BROADWAY	WAKEFIELD	HANDLER	NON-NOTIFIER HW FAC THAT IS SUBJ TO REGS BUT NOT PERMITTED

UNDERGROUND STORAGE TANKS WITHIN WAKEFIELD'S WATER SUPPLY PROTECTION AREAS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
PUMP N PANTRY MOBIL	950 MAIN ST	WAKEFIELD	Gas Station	10000	Gasoline
PUMP N PANTRY MOBIL	950 MAIN ST	WAKEFIELD	Gas Station	8000	Gasoline
RILO'S VIP	343 ALBION ST	WAKEFIELD	Gas Station	2000	Gasoline
RILO'S VIP	343 ALBION ST	WAKEFIELD	Gas Station	2000	Gasoline
RILO'S VIP	343 ALBION ST	WAKEFIELD	Gas Station	3000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities located within the water supply protection area(s) should be considered in local drinking water source protection planning.